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ABSTRACT

A partnership between the New York City Central Labor Council and the Center for Advanced Study in Education, City University of New York, New York, planned, conducted, and evaluated a worker literacy program for health care paraprofessionals who prepared for college as a step towards career advancement. The program featured close involvement of labor unions; reading, writing, and math instruction contextualized in health care; and educational counseling. The program provided 168 hours of instruction. A high school diploma or equivalency was required for entry. Characteristics of the typical participant were as follows: low income; female; minority ethnicity; English as a native language; single head of household with family responsibilities; attended 12th grade but did not graduate from high school; and had high school equivalency. Of the 153 participants (nurses' aides, home health aides, and other paraprofessionals), 60 percent attended up to 126 hours and 47 percent completed the 168 hours. Noncompletion appeared to be most closely related to personal problems. Two methods of literacy assessment were used--project-developed tests and teacher ratings. Both methods revealed pre-post literacy gain. A follow-up study showed that 62 of a sample of 96 participants had been accepted to college; 23 of the rest planned to apply. (Appendices include the following: formative evaluation reports, recruitment flier, initial literacy assessment measure, teacher rating scale, information survey, follow-up surveys, counseling forms, and announcement of related curriculum. A brief performance report is also provided.) (Author/NLA)

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WORKPLACE LITERACY INSTRUCTION FOR COLLEGE PREPARATION OF HEALTH CARE WORKERS

FINAL EVALUATION REPORT

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FOR COLLEGE PREPARATION OF HEALTH CARE WORKERS

FINAL EVALUATION REPORT

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We greatly value the meticulous attention, effort and thoughtfulness of the Project Evaluators, Professor Elizabeth Langan and Professor Geoffrey Akst. Professor Alan Gross made useful suggestions for the data analysis, which was competently performed by Loongmun Wong and Daphne Greenberg. Bert Flugman, Director of the Center for Advanced Study in Education (CASE), made many helpful suggestions for planning and conducting the project, and commented on an earlier version of this report.

We thank Sarah Newcomb, Program Officer at the U.S. Department of Education, Office of Vocational and Adult Education, for her helpful guidance throughout the project period.

Note

Portions of this report are drawn from two papers describing the project and its outcomes, Perin (1992) and Perin & Greenberg (1992), referenced in the Dissemination section of the report.

WORKPLACE LITERACY INSTRUCTION FOR COLLEGE PREPARATION OF HEALTH CARE WORKERS

FINAL EVALUATION REPORT

ABSTRACT

A labor-university partnership, developed with the support of federal funding, planned, conducted and evaluated a worker literacy program for health care paraprofessionals who prepared for college as a step towards career advancement. Project features included close involvement of labor unions, reading, writing and math instruction contextualized in health care, and educational counseling. The program provided 168 hours of instruction which the participants attended on their own time. A high school diploma or equivalency was required for entry. Characteristics of the "typical" participant were: low paid, female, minority ethnicity, English as a native language, single head of household with family responsibilities, attended twelfth grade but did not graduate from high school, had high school equivalency obtained through union education program. Sixty percent of the participants attended for up to 126 hours and 47% completed the 168 hours. Non-completion appeared to be most closely related to personal problems. Two methods of literacy assessement were used, project-developed tests and teacher ratings. Both methods revealed pre-post literacy gain. The program has been institutionalized by the labor partner. Recommendations for future programs are offered.

WORKPLACE LITERACY INSTRUCTION FOR COLLEGE PREPARATION OF HEALTH CARE WORKERS

FINAL EVALUATION REPORT

EXECUTIVE SUMMARY

The health care industry in the United States has been facing a shortage of workers to fill professional positions such as registered nurse and respiratory technologist. There is a large pool of paraprofessional health care workers interested in advancing to these jobs. Many hold high school diplomas or equivalencies and could enter college programs to prepare for the jobs but are excluded from doing so because of low literacy skills.

A labor-education partnership developed and evaluated a model worker literacy program to prepare health care paraprofesionals for college programs in health areas. The objectives of the model program were (1) to improve reading, writing, math and study skills in the context of health material relevant to later college study, and (2) to prepare participants for college placement exams in reading, writing and math.

The labor partner was the New York City Central Labor Council, AFL-CIO Workplace Literacy Program. Within that organization, the Consortium for Worker Education played an active role. The education partner was the Center for Advanced Study in Education (CASE), Institute for Research and Development in Occupational Education of the City University of New York Graduate School (CUNY).

Project participants were 153 nurses aides, home health

attendants and other paraprofessionals who were members of three unions in the labor organization, Service Employees International Union, Local 144; Drug, Hospital and Health Care Employees Union, Local 1199; and American Federation of State, County and Municipal Employees, District Council 1707.

Participants were recruited through fliers posted in the workplace, presentations by union business agents, announcements in union newspapers, and word of mouth. They were screened for entry using a writing assessment that was scored according to a scale developed by CUNY for assigning students to college remedial classes.

Classes were given six hours per week for eight months in union headquarters and a union supported educational center. The workers attended on their own time. There was no employer involvement in this program. Classes were scheduled in accordance with the times of job shifts. Three-hour classes were held on weekday mornings and evenings, and six-hour sessions were held on Saturdays. Teachers had a background in either adult literacy or college remedial instruction. Towards the end of the project, in response to participants' request, the labor organization provided a six-week science course that was an addition to the original program.

A worker literacy curriculum was developed through task analysis of the literacy demands in college classrooms in health areas, and the college placement tests. The skills taught were

typical of these taught in college remedial courses but what was different was that they were directly contextualized in health related science and health care job practices.

Most of the reading and writing instruction was keyed to three textbooks used in community college health programs, in the areas of anatomy and physiology, introductory chemistry, and medical terminology. At the same time as learning literacy skills, participants previewed the science content that they would soon be learning in college.

The math curriculum was based on arithmetic skills needed in nursing and other health programs, including medical dosage calculation, and also on common health care job practices. Math skills were almost always contextualized in health care, and included operations for decimals, fractions, percent, signed numbers, and conversions and standard measurement scales. Writing and verbal communication skills were incorporated in math instruction.

Teaching methods combined collaborative and traditional approaches. An example of a collaborative method used was the formation of small groups of students who completed assignments together. A "recorder" appointed by each group reported the group's ideas and answers to the whole class. Traditional methods included direct teaching and recitation. The project produced a videotape package to supplement classroom instruction. The package contains six biology and chemistry lectures with

supporting literacy and study skills exercises.

In addition to classroom instruction, participants received educational counseling. The counselor conducted workshops and saw participants individually in order to familiarize them with college programs in health areas, to help them choose appropriate programs, to introduce them to college application, entry and financial aid procedures, and to support time management and study skills.

Characteristics of the "typical" participant included: low paid paraprofessional health care worker interested in career advancement in the health industry; poor literacy skills; female, aged in forties; ethnic minority status; English as native language; single head of household with family responsiblities; attended twelfth grade but did not graduate; had high school equivalency certificate obtained through union education program.

Program participation was as follows:

Responded to recruitment material: n=176

Accepted based on screening test: n=153

Began program: n=125

Leavers: left program after 1 or 2 classes, maximum 12 hours instruction: n=26

Total Attenders (excluding Leavers): n=99

Short Stayers: stayed approx. 7 weeks (42 hours): n=27

Medium Stayers: stayed approx. 14 weeks (84 hours): n=13

Long Stayers: stayed approx. 21 weeks (126 hours): n=12

Completers: stayed approx. 28 weeks (168 hours): n=47

Completion rate (Completers as a percent of Attenders): 47%

Combined Long Stay + Completion Rate: 60%

The retention rate of 47% for the full 28 weeks and 60% for a 21-week period is compatible with research on retention rates in adult basic education. Completers and non-completers did not differ with regard to educational background, age, family responsibilities, family support for participation, first language, current job, job objective, or entry literacy skills. However, there were some differences in the extent of literacy gain. Twenty-one weeks into the program, completers had signficantly higher reading and math scores than the long stay group, who left the program soon after that point.

Reasons given by participants for leaving the program prior to completion pertained mostly to family and personal problems. However, about one-third of a sample of non-completers found the pace of instruction too fast.

Literacy skills were measured in two ways, by simulated college placement tests in reading, writing and math, and teacher ratings. The pattern of gains was different depending on the measures used. Both assessment methods showed significant pre-post gain for writing. The tests showed gain for math but not reading, while the teacher ratings showed gain for reading but not math.

A follow-up survey taken in the third and fourth month after

the end of classes revealed that 65% of a sample of 96 participants had been accepted to a college. Of these individuals, 53% were entering nursing programs, 18% programs in health specializations, and 24% non-health programs, mainly Liberal Arts. Five percent of the sample were entering non-degree Licensed Practical Nurse programs.

Based on the follow-up survey, data were available for seventeen college entrants who had taken college placement tests. Of these, 59% passed the reading test, 41% passed the writing test and 65% passed the math test. The small amount of information on placement test scores resulted from a relatively long lag time between the worker literacy program and college entry.

College remedial placement levels of program completers were estimated based on current procedures in CUNY community colleges. Based on examination of scores on the simulated college placement tests, there was a positive shift towards exemption from remedial requirements, a shift that was particularly impressive in the writing area. The positive shift in the math area was mitigated by the estimate that many of the completers entered the program already exempt from arithmetic remediation. There was little change in the reading area. This pattern of findings may be partly explained by the relationship of the simulated tests to the worker literacy curriculum; the reading test had the least relation to the curriculum while the writing test had the

greatest.

The project was disseminated by means of publications, conference presentations, and newsletter articles and announcements. The curriculum products developed in the project (reading-writing curriculum guide, mathematics curriculum guide, and self-study video package) are being disseminated nationally.

The project was successful in developing a model program and curriculum for paraprofessional health care workers who wanted to prepare for college programs leading to career advancement in the health industry. The labor-education partnership worked well in planning and delivering literacy instruction and educational counseling. The labor organization was highly committed to and fully involved in the project. The unions played a leadership role in determining and serving the educational needs of their members. The worker literacy program has been institutionalized by the labor partner using the project curriculum materials.

A series of recommendations was made by the project evaluators, in reports appended to the Final Evaluation Report.

Additional recommendations are as follows:

1. Increase staff development in the articulation of literacy and health science instruction.

2. Building on the appended evaluation reports, increase teachers' involvement in curriculum revision. Curriculum developers in future programs should work directly with instructors in revisions of instructional units.

3. Based on the appended reading-writing evaluation report, select teachers who share the program's dual goal of preparation for college level work in health areas and preparation for generic placement tests.

4. Provide more direct test preparation in the reading area.

5. Screen for reading and math skills, in addition to writing. If feasible, instructional schedules should be individualized so that entrants with relatively strong skills in one area are assigned to less instruction in that area and more in the weaker area.

6. Assess career-related motivation and career knowledge pre and post and relate these measures to retention.

7. Provide a month-long pre-program "try-out" to orient participants to college preparation and college, and to provide a sample of the literacy instruction including practice tests, to help participants evaluate their level of motivation for the long-term effort required.

8. Accommodate participants who find the instruction too fast, for example, through supportive tutoring, ideally peer tutoring.

9. If feasible, lengthen the program for participants who are not showing sufficient literacy gain. A two-year program is not unrealistic for this population.

10. To maximize the effects of the worker literacy program,

the participants should take the college placement tests immediately after program completion. The unions should provide academic support and counseling during any lag time.

11. The unions should also provide ongoing support throughout college. Both academic support, for example through tutoring, and educational counseling should be available. If feasible, a counselor should set up and monitor support groups whose activities would start at the time participants are applying for college, and then continue through the period of college study.

12. The colleges should pair each participant with a mentor throughout the period of college study.

13. Conduct longitudinal research into the characteristics of participants who are successful each year in college study. Variables should include academic skill, age, level of motivation, support available to the student, age of dependents, level of family responsibility, and others.

14. Continue to explore and develop appropriate literacy assessment measures. Research should focus on the relationships among multiple measures and search for reasons for differences in findings between relatively objective and subjective measures.

OVERVIEW

The health care industry in the United States has been facing a shortage of workers to fill professional positions such as registered nurse, radiology technologist, repiratory therapist, occupational therapist, and medical lab technologist. Although state budget cuts have resulted in fewer than expected professional health care job openings, should the economy improve, a large number of positions will again need to be filled. There is a large pool of paraprofessional health care workers interested in advancing to professional level jobs. Many hold high school diplomas or equivalencies and could enter college programs to prepare for such jobs, but are excluded from doing so because of low literacy skills.

A labor-education partnership developed and evaluated a model literacy program to prepare such individuals for college programs in health areas. The objectives of the model program were (1) to improve reading, writing, math and study skills in the context of health material relevant to later college study, and (2) to prepare participants for college placement exams in reading, writing and math.

The program included the following features:

- close involvement of labor unions
- reading-writing and math classes contextualized in health care
- educational counseling
- participation on workers' own time
- scheduling to accommodate work shifts

- classes and counseling given on union premises
- combination of collaborative and traditional learning methods
- periodic assessment of reading, writing and math abilities
- recommendations from student representatives

The program has been institutionalized by the labor partner, using the curriculum materials developed in the project.

PARTNERS

The labor partner was the New York City Central Labor Council, AFL-CIO Workplace Literacy Program. Within that organization, the Consortium for Worker Education played an active role in all project conduct. The education partner was the CASE Institute for Research and Development in Occupational Education of the City University of New York Graduate School (CUNY).

ADVISORY COMMITTEE

An advisory committee was formed that included the following people, in alphabetical order:

Dr. Mary Beth Early
Professor and Director of Co-Prep Program
LaGuardia Community College, CUNY

Mona Faffarman
Education Coordinator, American Federation of State, County and Municipal Workers, Local 1707

Dr. Francine Gilkenson
Coordinator, Consortium for Worker Education
New York City Central Labor Council, AFL-CIO Workplace Literacy Program

Dr. Wilhelmina B. Glanville
Deputy Head, Nursing
Borough of Manhattan Community College, CUNY

Dr. Jacqueline LeBlanc
Chairperson, Biology Department
College of Staten Island, CUNY

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Director, Nursing Program
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Service Employees International Union

Eric Schtob
Director, Hospital League/Local 1199
Training and Upgrading Fund
Drug, Hospital and Health Care Employees Union

Dr. Mary Tobin
Acting Director, Nursing Program
LaGuardia Community College, CUNY

EVALUATION ACTIVITIES

The project evaluators were Dr. Elizabeth Langan of the College of Staten Island, CUNY, and Dr. Geoffrey Akst of the Borough of Manhattan Community College, CUNY. The major part of their work was in the formative evaluation of the project. They reviewed and made recommendations for revisions of the program design, recruitment flier, selection procedures, curriculum, instructional practices, and assessment. They reviewed and suggested revisions for the initial literacy assessment instrument, teacher rating forms, and periodic literacy assessments. They made major contributions to curriculum development, reviewing units and suggesting revisions. The evaluators observed classes, and interviewed teachers and students to estimate the quality of the curriculum and instruction. Their reports of these activities are included in the Appendix.

The formative evaluation was extremely valuable in program development. The evaluators were highly knowledgeable about the population being served and with the literacy difficulties older, nontraditional learners often faced in college programs. The large majority of the evaluators' suggestions were implemented as the program evolved.

Summative evaluation consisted of pre-post comparisons of

scores on two types of literacy measure: reading, writing and math tests developed by the curriculum developer, and teacher ratings. The results of statistical analyses are reported in the section on outcomes below. Other parts of the summative evaluation included computing retention rate, rate of college entry, and estimated college remedial placement levels (described below).

DESCRIPTION OF THE PROGRAM

Project participants were members of three unions in the labor organization, Service Employees International Union, Local 144; Drug, Hospital and Health Care Employees Union, Local 1199; and American Federation of State, County and Municipal Employees, District Council 1707. The program was named the "CLC/CWE/CUNY College Preparation Program." "CLC" stood for the Central Labor Council, "CWE" for the Consortium for Worker Education, and "CUNY" for the City University of New York.

Recruitment

Recruitment fliers (see Appendix) were posted by the unions in the workplace, union business agents made presentations, announcements were placed in union newspapers, fliers were mailed to participants of previous union education programs, and information was given by word of mouth. One hundred seventy-six health care paraprofessionals applied to the program as a result

of these activities.

Selection

In accordance with the educational philosophy of the labor partner, screening was minimal. To be eligible for the program, an individual had to be a member of one of the three unions, present a high school diploma or equivalency certificate, and pass a screening assessment.

The assessment, included in the Appendix, was an essay assignment that called for discussion of an ethnical dilemma arising in health care jobs. The essays were scored on a six-point holistic scale used by CUNY to score college writing placement tests. To be exempt from writing remedial requirements, CUNY requires that college entrants receive a scores of 4 from each of two independent judges.

Applicants to the current program who scored 2 and above (153 individuals) were accepted. Seventy-five percent of those accepted had a score of 2, 21% had a 3 and 5% had a 4. Thus, writing skills of entrants were poor, despite the fact that they possessed secondary education qualifications.

Worker Literacy Classes

Classes were given for eight months in union headquarters and a union supported educational center. The workers attended

the program on their own time. Participation was voluntary, and workers were self-identified as being in need of literacy instruction. There was no employer involvement in the program.

Classes were scheduled in a flexible manner, in accordance with times of job shifts. Prior to establishing the class schedule, a survey was taken of participants to ascertain their scheduling preferences. Three-hour classes were held on weekday mornings and evenings, and six-hour sessions were held on Saturdays.

Participants attended classes six hours per week for twenty-eight weeks over an eight-month period, for a total of 168 hours of instruction per participant, divided evenly between reading-writing and math classes. The reading-writing teachers were experienced in adult literacy instruction, and the math teachers were community college adjunct remedial math instructors.

Towards the end of the eight-month instructional period, a number of participants expressed to the counselor that they felt they needed additional science instruction in order to be ready for college study. In response, the labor organization set up a six-week anatomy and physiology and introductory chemistry course, taught by a science instructor. During the course, the counselor set up and monitored study groups, which met for twenty minutes before each class. Thirty individuals signed up for the course, and 19 attended.

Worker Literacy Curriculum

The project developed two curriculum guides, one for reading and writing (Perin & Kalash, 1991) and one for math (Perin & Gallin, 1991), both referenced in the section on project products below. The reading-writing curriculum guide contains 48 instructional units, and suggestions for assessment. The math curriculum contains 52 instructional units and four tests. Both curriculum guides were developed on the basis of a literacy task analysis which identified specific literacy skills the workers would need in college. Interviews were conducted of directors of college nursing programs and other faculty who were teaching health related science and math courses. These people not only pinpointed literacy skills needed in their programs but indicated the special literacy needs of health care workers entering college. In the past, these workers have dropped out in large numbers because they were underprepared for college. Union staff were consulted regarding routine job practices of paraprofessional and professional health care workers so that these could also be incorporated in the literacy curriculum.

A sample of textbooks used in community college health programs was examined, and the placement tests taken on college entry were analyzed. A list of literacy skills emerged from this investigation, and provided the basis for the curricula. The literacy skills were typical of those taught in college remedial courses but what was different was that they were directly

contextualized in health related science and health care job practices, and emphasized the literacy skills particularly needed by the workers.

Most of the reading-writing instruction was keyed to three textbooks used in community college health programs, in the areas of anatomy and physiology, introductory chemistry, and medical terminology. The participants would use either these or very similar texts when they entered the college programs. Thus, at the same time as learning literacy skills, students previewed the content they would soon be learning. Another text used was an oral history of health care workers; this contained familiar job-related topics.

The project received permission from the textbook publishers to duplicate a set number of copies of specific chapters for use in the program. The oral history text was a paperback book which the students purchased at a discount arranged by project staff.

The math curriculum is based on arithmetic skills needed in nursing and other health programs, including medical dosage calculation, and also on common job practices in the health care field. Arithmetic skills, almost always contextualized in health care, included operations for decimals, fractions, percent, and conversions between metric and standard measurement scales. Signed numbers were taught in the context of measuring body temperature. Writing and verbal communication skills were incorporated in math instruction. The curriculum units called

for participants to explain the steps of solving problems to each other, and also keep learning journals as part of summarizing each lesson.

Each unit specified that further review and practice would be based on given sections from a widely used mathematics textbook used in remedial math programs. The students purchased copies of this text at a discount arranged by project staff.

At regular intervals, the participants took practice tests that simulated the college placement tests in reading, writing and math that they would have to take on acceptance to CUNY colleges. The tests, which were prepared by the project curriculum developers, were given approximately every seven weeks. Thus, the students had four practice test experiences in each of the three areas, so that twelve tests were given over the project period. The test scores provided feedback to students and teachers, and also served as a means of assessing progress, further discussed below.

The functional context approach on which the curriculum was based stressed both science content and literacy skills. Ideally, both areas should be taught to an equal degree, employing teachers expert in both. However, given the considerable literacy needs of the population and the difficulty finding teachers equally able to teach both science and language arts, the curriculum placed literacy in the foreground and science in the background, so that literacy was contextualized in science.

There were initial difficulties on the part of some of the reading-writing teachers regarding this approach because of their lack of familiarity with and enthusiasm for science, which contrasted with the students' high level of interest. In future programs, a greater amount of staff development would be useful in order to familiarize the reading-writing teachers with the science content.

Teaching Methods

A combination of collaborative and traditional approaches was used. In collaborative learning activities, participants worked in groups, accomplishing assignments together. This approach alternated with traditional teaching where the teacher explained material, asked questions, and led class discussions. Further discussion of the teaching methods is contained in Perin & Gartner (in preparation) and Perin (1992), both referenced in the dissemination section below.

Supplementary, Independent Study using Videotapes

The project produced a videotape package (Perin, Ortiz, Cohen & Abkemeier, 1991, referenced below) in order to supplement classroom instruction. Drafts of this material were used during the project period and the final version has been given to the labor partner for use in the institutionalization of this program.

Educational Counseling

Educational counseling and academic advisement were given during the eight months of classes and then for several months afterwards. In workshops and individual meetings, the project counselor familiarized participants with the programs in health areas offered by the various CUNY community colleges; helped them choose programs; introduced them to college application, entry and financial aid procedures; provided information about support services offered by the various colleges; and discussed aspects of college preparation such as time management and study skills.

The counselor scheduled the workshops at regular intervals and presented them during class time. He brought in a variety of materials which he handed out, and opened discussion so that participants could ask questions and air their concerns about college entry and career advancement in the health industry. A major concern for the participants, who were poorly paid, full-time workers with families, was financial aid. The counselor was highly knowledgeable on this and a wide variety of other relevant topics. Perhaps the dissemination of information was the most important aspect of educational counseling.

The counselor scheduled the individual meetings before, after or during classes. At the beginning of the program, the counselor announced the availability of counseling to each class and invited students to make appointments. Those who did not respond to this offer were approached and encouraged to schedule

an appointment. During the first individual meeting, the counselor obtained background information (see Counseling Intake Form in the Appendix). At subsequent meetings, the counselor and student jointly completed a Counseling Log form (see Appendix). This activity was not particularly successful because both students and teachers found it tedious.

Teachers were asked at several points to remind students who were not already doing so to make regular appointments. Almost all of the participants saw the counselor regularly.

The counselor followed up on participants whose attendance was dwindling or had stopped, asking them to schedule a counseling appointment. He attempted to reach them by phone but since this was often very difficut, he wrote letters to their homes, to which a Student-Counselor Intercommunication form was attached (see Appendix for two examples). A self-addressed, stamped envelope was enclosed. Follow up was an important activity, and several students who had not planned to continue in fact resumed participation.

The counselor also set up and monitored study groups. He visited each classroom and facilitated the grouping or pairing of students, based on geographic proximity of job or work. However, because the students were extremely short of time, and tended to be exhausted by their often physically demanding jobs, only a few participated in study groups. Increased "time on task" is a continuing problem in adult basic education.

A committee of student representatives, described in the next section, was set up and facilitated by the counselor.

Counseling was felt to be a key element of the program. It is understandable that the participants, who were mature, responsible workers and family providers, nevertheless lacked information about how to enter college after many years away from formal education. Counseling served a dual function of providing information and supporting the learning process.

Committee of Student Representatives

A committee of student representatives was formed to express participants' concerns and reactions to the program while it was in progress. At a time when the teacher was not present, each class elected two representatives. Then, each class held a discussion, under the leadership of the representatives, in which recommendations for program development were made. The representatives met to share information that emerged from these discussions. The group formulated a list of recommendations for future programs that they relayed to the counselor.

Most of the recommendations pertained to specific details of instruction rather than more global program changes. Following the initial meeting, the representatives expressed to the counselor additional concerns emanating from their classes.

The specific recommendations made by the representatives included more quizzes, exams, homework, use of science reference

texts, and course outlines. It was also recommended that basic skills be taught using more general content, to balance the use of health care specific content. Also, individualized instruction such as tutoring was recommended.

CHARACTERISTICS OF PARTICIPANTS

The information below is based on several surveys (see Appendix) administered during the course of the program. Response rates varied and percentages shown in the tables below are based on the number of responses given to specific questions.

CURRENT JOB (n=139)	%
Nurse's aide	48
Home attendant	12
Licensed practical nurse	4
Other direct care	7
Social services	2
Education aide	4
Clerical	17
Maintenance/food	6

JOB OBJECTIVE (n=139)	%
Registered nurse	50
Health specialization	35
Licensed practical nurse	6
Other	7

Health specializations include: radiology technician, respiratory therapy assistant, physical therapy assistant, occupational therapy assistant, medical lab technologist, and medical records technologist.

All participants spoke English fluently, but not all spoke English as a first language.

FIRST LANGUAGE (n=139)	%
English	69
Spanish	17
French	9
Other	4

AGE (n=138)	%
22-30	24
31-40	34
41-50	42

GENDER (n=153)	%
Female	95
Male	5

ETHNICITY (n=153)

With the exception of one Asian-American student, participants were of African-American and Latino backgrounds.

SINGLE HEAD OF HOUSEHOLD (n=83): 71%

FAMILY RESPONSIBILITIES (n=88)	%
Responsible for dependents	85
Responsible for 1-3 dependents	73

Dependents include both own children, and young and elderly relatives for whom the participant is directly responsible.

SECONDARY CREDENTIAL (n=95)	%
High school equivalency	54
Regular high school diploma	30
Both equivalency and diploma	17

High school equivalencies had been earned, in most cases, through union education programs.

COUNTRY OF HIGH SCHOOL (n=79)	%
United States	52
Abroad	48

HIGHEST GRADE COMPLETED	%
Ninth	5
Tenth	17
Eleventh	12
Twelfth	67

PREVIOUS COLLEGE EXPERIENCE (n=115)	%
Attended college course(s) in past	43

Summary of Participant Characteristics

Characteristics of the "typical" participant included:

- low paid paraprofessional health care worker interested in career advancement in the health industry
- poor literacy skills
- female, aged in forties
- ethnic minority status
- English as native language
- single head of household with family responsiblities
- attended twelfth grade but did not graduate
- had high school equivalency certificate obtained through union education program

PROJECT PRODUCTS

The project produced three curriculum products which are being disseminated nationally on a cost-recovery basis (see Appendix for order form):

Perin, D. & Gallin, M. (1991). College preparation for health care workers: Mathematics curriculum guide. CASE 16-91. New York: Center for Advanced Study in Education, CUNY Graduate School.

Perin, D. & Kalash, B. (1991). College preparation for health care workers: Reading-writing curriculum guide. CASE 13-91. New York: Center for Advanced Study in Education, CUNY Graduate School.

Perin, D., Ortiz, R.K., Cohen, A., & Abkemeier, M.L. (1991). College preparation for health care workers: Videotape science lectures. CASE 21-91. New York: Center for Advanced Study in Education, CUNY Graduate School. (6 lectures on anatomy and physiology, and introductory chemistry, with viewing guide containing literacy activities based on the lectures).

Three written reports and several newsletter articles and announcements were also produced, as described below in the section on dissemination of the project. Sections of the current report are based on or drawn directly from those earlier reports.

PROGRAM OUTCOMES

Retention

Program participation was as follows:

Responded to recruitment material: n = 176

Accepted based on screening test: n= 153

Began program: n=125

Leavers: left program after 1 or 2 classes, maximum 12 hours

instruction: n = 26

Total Attenders (excluding Leavers): n=99

Short Stayers: stayed approx. 7 weeks (42 hours): n = 27

Medium Stayers: stayed approx. 14 weeks (84 hours): n = 13

Long Stayers: stayed approx. 21 weeks (126 hours): n = 12

Completers: stayed approx. 28 weeks (168 hours): n = 47

Completion rate (Completers as a percent of Attenders): 47%

Combined Long Stay + Completion Rate: 60%

The retention rate of 47% for the full 28 weeks and 60% for a 21-week period is compatible with research into retention rates in adult basic education (see Perin, 1992 for a discussion of this topic). Perin & Greenberg (1992), referenced in the section on Dissemination, below, examined differences between groups of participants as a function of length of time in the program. There were no differences between completers and non-completers in educational background, age, family responsibilities, family support for participation, first language, current job, job objective, or entry literacy levels. However, there were some differences in the extent of literacy gain. At the third testing period (see section on Literacy Gains, below), 21 weeks into the program, completers had significantly higher reading and math scores than the long stay group, who left the program soon after this point.

Expressed Reasons for Non-Completion

In a follow-up survey (see Appendix), a sample of non-completers (n=34) gave reasons for leaving the program, as follows:

Reason	%
Family problems	38
Pace of instruction too fast	34
Personal health	21
General problems with classwork	9
Geographic location of class	9
Class schedule	6
Pace of instruction too slow	3

(Note: some respondents gave more than one reason.)

The most often cited reasons for leaving the program were personal (family problems and personal health), mentioned by 59% of the respondents. Corroboration of the importance of personal reasons is that 56% said that they would be interested in re-enrolling.

Literacy Gains

Literacy skills were measured in two ways. First, participants took four practice tests in reading, writing and math, which were simulations of college placement exams. Second,

teachers rated the students on curriculum-based skills three times during the eight month period.

The reading practice tests consisted of 40 or 45 one-paragraph passages followed by multiple choice comprehension questions. The writing tests contained essay questions calling for agreement or disagreement with a given statement. As with the screening instrument described in the section on Selection, above, the essays were scored holistically, using a six-point scale developed by CUNY. The math tests consisted of 20 to 30 multiple choice arithmetic questions.

Literacy gains, as measured by completers' scores on the first (pre) and fourth (post) tests in each area, are shown below. Group means are shown for each test. In each case, n represents the number of completers who took both the first and fourth tests.

Literacy Gains: Reading, Writing and Math Tests

	Pre	Post	t	df	p
Reading (n=40): % correct	41.07	42.00	-0.49	39	ns
Writing (n=40): 6pt.scale	2.45	3.50	-12.02	39	<.000
Math (n=43): % correct	64.42	82.55	-9.52	42	<.000

The differences between the pre and post scores in writing and math were statistically significant but the reading scores were not.

In the second method of literacy assessment, the teachers

rated each participant's skills based on classroom observations. Reading comprehension, writing, study skills, math concepts, math calculations, and critical thinking skills were rated separately, using a five-point scale that ranged from poor to excellent mastery of teh skills being taught. A reading-writing and a math score were calculated for each student by taking a mean of the ratings for the period in each area. The first (pre) and third (post) ratings for the completers are shown below.

Literacy Gains: Teacher Ratings

	Pre	Post	t	df	p
Reading-Writing (n=44)	2.89	3.49	-5.71	43	<.000
Math (n=44)	3.14	3.15	-0.06	43	ns

The difference between the pre and post reading-writing ratings were statistically significant but the math ratings were not.

Reading comprehension and writing ratings were examined separately in order to make a comparison with the reading and writing tests. The pre and post ratings were as follows.

Teacher Ratings: Reading Comprehension and Writing

	Pre	Post	t	df	p
Reading Comprehension	2.93	3.50	4.96	43	<.000
Writing	2.64	3.45	6.24	43	<.000

In the writing area, the test scores and teacher ratings both show significant gain from pre to post. However, the pattern of findings is different for reading and math. In the reading area, test scores did not change while teacher ratings showed significant gain. The reverse pattern was found in the math area, where test scores improved signficantly from pre to post while teacher ratings suggested no change.

College Entry

A follow-up survey taken in the third and fourth month after the end of classes revealed that 62 (65%) of a sample of 96 participants had been accepted to a college. Of the remaining 32, 23 (72%) planned to apply and nine (28%) did not. It is notable that some of the college entrants were program non-completers. It is possible that some of the non-completers left because they felt that they had met their goals. The college programs entered are shown below.

College Programs Entered (n=62)

Registered Nurse: 53%

Health Specialization: 18%

Other degree program: 24%

Licensed Practical Nurse (non-degree): 5%

It can be seen that 24% of the college entrants entered programs not in the health area. Most of these participants were entering Liberal Arts programs. It is possible that through participating in the college preparation program, they realized that they did not want to pursue health programs after all. If this is the case, the program served a function of goal clarification, resulting in the early screening out of inappropriate or uninterested individuals from college health study, saving college resources and student effort at a later date.

Scores on College Placement Tests

In CUNY colleges, placement tests are given after an applicant has been accepted to a college. Information is available for n=17 entrants who had taken the tests three to four months after the end of the worker literacy classes. Of these, ten (59%) passed the reading test, seven (41%) passed the writing test, and 11 (65%) passed the math test. These individuals are exempt from remedial classes in these areas, while those who did not pass will need remediation either concurrent with or prior to taking credit-bearing courses, depending on the program.

The small amount of information on placement test scores results from a relatively long lag time between the college preparation program and college acceptance. Some of the participants delayed their application for personal and job

reasons, while for others the application was in process at the time of data collection. To capitalize on the positive effects of the program, participants should take the placement tests immediately after completion. Since participants can easily lose momentum, it would be helpful in future programs for the unions to provide academic support and counseling during the lag time. Resources for longer term follow-up would seem important in order to assess the results of the worker literacy program.

Estimated College Remedial Levels

Based on the initial literacy assessment (see Selection, above), most of the participants would have been assigned to the lowest level of community college remedial writing class at the time of entry to the worker literacy program. It is of interest to estimate the level of remediation still needed on leaving the program, since many participants, despite literacy gains, could not be expected to pass the placement tests, i.e., be exempt from remediation.

Estimates of levels of remedial classes for completeres were made based on the placement procedures in one of the CUNY community colleges. Cut-offs used by this college to assign entrants to classes were similar to those used by the other CUNY colleges. The following outcomes are possible for a given entrant.

Reading: exempt (passed test); upper level; middle level; lower level

Writing: exempt (passed test); upper level; lower level

Arithmetic: exempt (passed arithmetic section of test); upper level; lower level.

The raw cut-off scores normally used by the college consulted were transformed to percents to conform with scores given in the program. Estimated placement levels were then determined for program completers, shown below. Pre-program estimates are based on participants' scores on the first test, seven weeks into the program, and post-program estimates are based on scores on the last tests, given at the end of the program. In each case, n refers to the number of completers who took both the pre and post tests.

Estimated College Remedial Placement Levels for Completers

		Percentage of Completers	
		Pre	Post
Reading	Lower	48	49
	Middle	40	47
	Upper	5	2
	Exempt	7	2
Writing	Lower	56	0
	Upper	40	56
	Exempt	5	44
Arithmetic	Lower	2	0
	Upper	21	17
	Exempt	77	83

This analysis suggests that the most effective part of the training, at least as measured by the simulated placement tests, was in the writing area. There was no change in reading remedial levels, and while there was positive change for math, many of the completers entered the program at a relatively high level of skill.

The lack of change in the reading area may be due to the nature of the test, which had the weakest relation to the curriculum of all the assessment measures. The test was generic and was in multiple choice format. While the curriculum included units to prepare for this type of test, most of the reading

instruction focused on comprehension of health related text, and did not emphasize multiple choice questions. In contrast, much emphasis was placed on essay writing, including a focus on the type of structure called for in "agree-disagree" questions found on the writing placement tests. Based on the placement estimates, future programs need to focus on more specific preparation for the generic, multiple choice reading test, since there appears to be little transfer from the reading comprehension abilities developed in the health context.

DISSEMINATION ACTIVITIES

Project operations, outcomes and products were disseminated through conference presentations, newletter articles and announcements, and papers prepared for publication.

Conference Presentations

The project director made the following presentations:

Work-Related Literacy Instruction for Adults: Research and Development Efforts. (Invited speaker). Second International Conference, British Dyslexia Association, Oxford, England. April 5, 1991.

Presentation as part of Panel on Making Workplace Literacy Work - Through Curriculum Development. Annual Conference of New York Association for Continuing/Community Education. May 7, 1991.

Worker Literacy for Health Care Workers: A Union-University Collaboration. Conference on "Research as Engagement: An International Conference on Developing Relationships between Trade Unions and Research Organizations," sponsored by the University of Leeds. Oxford, England. July 16, 1991.

Literacy Instruction for College Preparation of Health Care Workers. 40th Annual Conference of the American Association for Adult and Continuing Education. October 16, 1991. Montreal, Canada.

Career Advancement for Health Care Paraprofessionals through College Preparation: A Union-University Collaboration. Work in America Institute, Meeting of Advisory Board to Job-Linked Literacy Project. New York, April 21, 1992.

Retention Patterns in an Adult Basic Education Program for Health Care Workers Preparing for College (with Daphne Greenberg). American Educational Research Association Annual Meeting. San Francisco. April 24, 1992.

Workplace Literacy: College Preparation for Working Adults. The Bronx Literacy Expo, sponsored by the Bronx Reading Council, The Bronx Principals Center, the NYC Association for Supervision and Curriculum Development, the Office of the Bronx Borough President, Lehman College/CUNY, and New York Telephone. Lehman College, Bronx, NY. May 14, 1992.

The project was also described in the course of other presentations made by the project director, such as at the Modern

Language Association Conference in Pittsburgh on September 14, 1991, and a conference on learning disabilities held at New York University on November 13, 1991.

Project staff may present information about the curriculum as part of a panel at the 1992 conference of the American Association for Adult and Continuing Education in Anaheim, CA. (A proposal has been submitted.)

Magazine and Newsletter Articles and Annoucements

Mentioned in article on low paid, female health care workers, "Climbing the Job Ladder," by Mary Keefe, City Limits, December 1991.

Mentioned in an article on literacy in health care settings, Business Council for Effective Literacy (BCEL) Newsletter, October 1991.

"Health Care Workers Prepare for College in Union Education Program," Literacy Update, Literacy Assistance Center, New York, April 1992.

"New York City Program Helps Would-Be RNs Prepare for Training," Report on Literacy Programs, April 2, 1992.

Curriculum materials announced Postsecondary LD Network News, University of Connecticut, Spring 1992.

Anticipated features in:

BCEL Newsletter, July 1992

International Reading Association, Adult Literacy Special

Interest Group Newsletter, July 1992.

Publications

Career Advancement for Health Care Professions Through College Preparation: A Union-University Collaboration. To appear in Job-Linked Literacy: Innovative Strategies at Work. Work in America Institute, Scarsdale, NY.

Retention Patterns in an Adult Basic Ecuation Program for Health Care Workers Preparing for College (with Daphne Greenberg). Paper prepared for AERA, submitted to ERIC.

A Union-University Literacy Partnership: A Case Study and Research Outcomes. In Proceedings of "Research as Engagement" Conference. Department of Adult Continuing Education, University of Leeds, England.

Papers in Preparation for Publication

Retention Patterns in a Worker Education Program for Health Care Workers (tentative title; being prepared for journal submission, with Daphne Greenberg).

Adult Basic Education and Cooperative Learning (tentative title; being prepared for journal submission, with Audrey Gartner).

Curriculum Networking

A set of curriculum materials was sent to the Northeast

Curriculum Coordination Center, in Aberdeen, New Jersey.

In addition, information about the curriculum materials was sent to the National Adult Literacy Data Base in London, Ontario for inclusion in its resources.

CONCLUSIONS

This project was successful in developing a model program and curriculum for paraprofessional health care workers who wanted to prepare for college programs leading to career advancement in the health industry. The labor-education partnership worked well in planning and delivering literacy instruction and educational counseling. The labor organization was highly committed to and fully involved in the project.

An important facet of this program was the quality of the collaboration of university and labor staff in decision-making. Importantly, since the unions had played a leadership role in determining the educational needs of their members at the time of proposal development, there were no difficulties executing the project once the funding was awarded. A sign of the unions' commitment to the project was that they provided a follow-up course in health related science in response to participants' request. The program has been institutionalized by the labor organization, using project curriculum materials.

Program participation required an eight-month commitment on the part of students, a relatively long time given full-time

jobs, poverty, and considerable family responsibilities. Despite this situation, sixty percent of the participants remained in the program for at least 126 hours while 47% completed the 168-hour program. Reasons given for leaving the program most often pertained to personal problems rather than program characteristics.

Some of the dropout may have been related to the difficulty some participants experienced with the academic demands of the program. It is probable that on entry to the program, were not aware of the specific academic demands of the college courses they needed for career advancement. Although the academic demands of the worker literacy program were considerably less than would be found in a college degree program, the program provided a preview of difficulties to be encountered later. This preview may have led to personal decisions not to continue in an unrealistic academic pursuit. Thus, the program may have served a purpose of screening out individuals who were not interested in or appropriate for college-level study. If this is the case, this function could be partially addressed in an initial orientation to the academic demands of preparing for a professional health care career, prior to literacy instruction.

Literacy gains were produced in reading, writing and math although the pattern of findings is different depending on the measure used. The lack of change on reading tests compared to the significant gain on writing and math tests seems to be at least

partially explained by the fact that the writing and math tests were closer to the curriculum than the reading test. Revisions in the curriculum seem indicated in order to strengthen test taking skills in the reading area, especially in light of the dual purpose of preparation for classroom academic reading and for preparation for college reading tests.

Further investigation is warranted regarding the different findings for gain on the tests compared with gain in the teacher ratings. While the method of teacher ratings may suffer from problems of subjectivity, teachers' judgments may be more valid than test measurement although of course the latter is more objective.

Four-month follow up revealed that 62 of 99 participants had been accepted to colleges. Because of the short-term nature of the project (18 months in all) it was not possible to conduct further follow up. This is unfortunate since the positive results of a program may only be apparent later on.

The project showed that it is possible to help health care paraprofessions improve their literacy skills and take an important step in career development, despite a considerable amount of time away from formal education, and despite work and family responsibilities. The success of the program seems due to the mix of union involvement, contextualized instruction, and counseling. Other labor organizations, hospitals, and the health industry in general, would probably benefit from this approach as

part of their efforts to make the health career ladder a reality for paraprofessionals.

RECOMMENDATIONS FOR FUTURE PROGRAMS

A series of recommendations regarding curriculum and instruction are found in the reports prepared by the Project Evaluators, appended. It should be noted that Dr. Akst's recommendation 3 (page 11 of his report) has already been acted on; substantial revisions have been made, with Dr. Akst's help, to the wording of exercises and tests throughout the math curriculum.

Additional recommendations are as follows:

1. Increase staff development in the articulation of literacy and health science instruction.

2. Building on the appended evaluation reports, increase teachers' involvement in curriculum revision. Curriculum developers in future programs should work directly with instructors in revisions of instructional units.

3. Based on the reading-writing evaluation report, select teachers who share the program's dual goal of preparation for college level work in health areas and preparation for generic placement tests.

4. Provide more direct test preparation in the reading area.

5. Screen for reading and math skills, in addition to

writing. If feasible, instructional schedules should be individualized so that entrants with relatively strong skills in one area are assigned to less instruction in that area and more in the weaker area.

6. Assess career-related motivation and career knowledge pre and post and relate these measures to retention.

7. Provide a month-long pre-program "try-out" to orient participants to college preparation and college, and to provide a sample of the literacy instruction including practice tests, to help participants evaluate their level of motivation for the long-term effort required.

8. Accommodate participants who find the instruction too fast, for example, through supportive tutoring, ideally peer tutoring.

9. If feasible, lengthen the program for participants who are not showing sufficient literacy gain. A two-year program is not unrealistic for this population.

10. To maximize the effects of the worker literacy program, the participants should take the college placement tests immediately after program completion. The unions should provide academic support and counseling during any lag time.

11. The unions should also provide ongoing support throughout college. Both academic support, for example through tutoring, and educational counseling should be available. If feasible, a counselor should set up and monitor support groups

whose activities would start at the time participants are applying for college, and then continue through the period of college study.

12. The colleges should pair each participant with a mentor throughout the period of college study.

13. Conduct longitudinal research into the characteristics of participants who are successful each year in college study. Variables should include academic skill, age, level of motivation, support available to the student, age of dependents, level of family responsibility, and others.

14. Continue to explore and develop appropriate literacy assessment measures. Research should focus on the relationships among multiple measures and search for reasons for differences in findings between relatively objective and subjective measures.

APPENDIX

Formative Evaluation Reports

Recruitment Flier

Initial Literacy Assessment Measure

Teacher Rating Scale

Information Survey

Follow-up Surveys

Counseling Forms

Curriculum Announcement

EVALUATION REPORT: TEACHER AND STUDENT INTERVIEWS, AND RECOMMENDATIONS
by Elizabeth B. Langan, Ph.D., Program Evaluator

Subject: Reading-Writing Component

TEACHER INTERVIEW #1

This teacher felt that Unit 28 ("Practice Writing Test") was the "key lesson to the whole curriculum"; said it provided students with a ladder on which to arrange their ideas, and that it proved to be a turning point for most of the students. This unit was very well supported, the instructor went on to say, by the units that focussed on particular types of paragraphs, with the one exception of Unit 22 on Compare/Contrast Paragraphs, which "asked students to compare apples and oranges . . . RNA and DNA . . . and utterly confused them." Felt there were no comparable reading units; indeed, that as a whole the reading units were weak. Singled out the unit on medical prefixes and suffixes as the weakest: "very complicated . . . over the students' heads," and suggested this unit be omitted to leave more time for work on such basics as subject-verb agreement and tense consistency. Also, while this teacher enjoyed the units working with material from LIFE AND DEATH, she found her students did not. They thought the reading tedious, and said "their own stories were better."

This teacher liked most about this program "the students, the content of the material, and having a basic curriculum to teach off of but not be glued to." Asked what she liked least about the program, she replied: "Being tied to a curriculum, and having too little time to work through the entire curriculum."

Additional comments: "This program doesn't understand its students." She feels the program is designed for "A" students, when it needs to cater to "C" students. Says the curriculum works for good students, but is too advanced for the rest: " This isn't subway reading, and these students aren't readers." Nonetheless, she acknowledged that both types of students made real progress. Similarly, she felt that "students were overwhelmed by content" in the science

units, but went on to say that the students are now "comfortable with the material." Overall, this teacher loved teaching in this program, and would be thrilled to have another opportunity to do so, which seems a substantive comment on the curriculum in itself. (It should be noted that this teacher replaced a teacher who resigned midway through the semester because she got a full-time job; the fact that this teacher was able to pick up in the middle of the course and carry-on points to another advantage of having a spelled-out curriculum as the foundation of a college-preparatory program.)

TEACHER INTERVIEW #2: SUMMARY

This teacher thought Unit 8 ("Writing an Essay" from an Outline) expecially good: "Several people made a significant leap toward a well-organized essay: the formula works." Also found Unit 26 ("Process Description Paragraph") an effective unit. The instructor acted as secretary to the class for this unit; the class worked as a group to write the paragraph, and near the end of the class the students suddenly "got it": they realized that, "my God, a paragraph is a REALLY LONG THING!"

Weak Units singled out by this instructor included Unit 22 (Writing Compare/Contrast Paragraphs)--students had trouble with this, and the examples from LIFE AND DEATH "weren't very clear"--and Unit 32 (Essay Evaluation and Editing for Errors): "In general, whenever I asked them to evaluate each other, I had trouble--a kind of non-response . . . they want a teacher with RED INK--of course, some of this response is emotional; it reflects their reluctance to be agents and lack of confidence in their own judgment," but some of this grows out of phrasing on the editing sheet, which is too "sophisticated," i.e. "descriptive language."

This teacher liked most about the program the curriculum's emphasis on the structure of reading and writing. "It makes good connections between reading

and writing." Also commended the emphasis on concepts and main ideas vs. details--"relentless pursuit of that is fundamental, and what they need."

Feels that "a gap" exists between the students' preparation and the material; noted that this comment refers "NOT to the science material, but rather to assumptions about students' literacy level." Suggested that additional reading activities (book reports, for example) be incorporated into the curriculum to bridge this gap. Also felt that the curriculum over-emphasized self-questioning as a reading technique: "this is a very abstract concept, and it makes reading seem very technical."

Additional comments: Those (science) texts are definitely scary to the students--but that's not necessarily bad. More time is needed, however, to focus on basic building blocks (sentence boundaries, agreement, etc.), rather than wasting time and energy memorizing SCAN etc. systems, which students haven't the basic skills necessary to implement effectively. Finally, feels that the distinct goals of the curriculum (the development of critical thinking skills as part of a "liberal arts" education, and passing the assessment tests) frequently conflict with rather than complement one another. Asks if these goals can be made "to dovetail a bit more neatly?"

TEACHER INTERVIEW #3: SUMMARY

This instructor was hard-pressed to name a particularly good unit, but finally picked out the Unit on Medical Terminology (prefixes and suffixes), because "the exercise was like playing a word game--it was fun--and all the information was there." Asked to describe one or two lessons that were not effective, this teacher responded that she didn't think the curriculum as a whole "worked well at all." More specifically, she described the Unit on the Cornell Note-Taking Method as "a disaster," and said that students' attempts to outline part of a chapter from their science text "didn't involve understanding, but was just a matter of lifting information from here to there with

no understanding." In short, this teacher found nothing positive about the curriculum.

This teacher DID like some aspects of the program, specifically, the students, and the second counselor. Felt the program was undermined by the use of a college science textbook "that was way out of the students' league." She felt there was no connection between working with the science text and preparing students for the assessment skills tests, that the curriculum gave "mixed messages" about the focus (was it remedial reading and writing, college-preparatory testing and study skills, or familiarizing students with science materials?), and that students needed basic science before they tackled the text used in this curriculum. Given this view of the curriculum, she felt three separate programs could (indeed, should) be derived from this program: a remedial reading and writing program (FREE, she stressed) that could use popular science materials; a basic science class taught by a science teacher; and finally, a series of workshops on test-taking skills to prepare students for the assessment tests.

STUDENT INTERVIEW #1: SUMMARY

This student found the units on outlining essays, and on different kinds of paragraphs, most useful and enjoyable. When asked to describe one or two lessons that didn't work, the student replied: "None. I was very frustrated by the lessons I just told you about, but by the end of the class I really felt good . . . like I really accomplished something." Described the teacher as "great--patient, understanding, willing to stay late." This student had not "found time," she said, to work with the counselor. She looked forward to every class, and liked most about the program the chance it gave her to "advance," and the chance to work with her peers in an academic setting. Insisted that the ONLY thing she disliked about the program was "train travel"--and it should be

noted she had a formidable commute to attend these classes. The one change she suggested was that potential students be tested in math as well as reading and writing before the program began; she felt her math class was saddled at the beginning with some students who wanted "to start more basic than we did." When asked if this problem (students at different levels of proficiency) occurred in her reading/writing class, she said it didn't because in these classes the teachers worked with students individually. Her final comment: this program "is a great idea for union members--a lot of them need a class like this."

STUDENT INTERVIEW #2: SUMMARY

This student answered the first question (re lessons most enjoyed, most useful) by explaining "I'm here for the CWAT," then went on to describe the unit on outlining as outstanding: "I got the whole idea, the concept," he exclaimed. While he felt none of the lessons proved a waste of time, he sometimes was frustrated by the slow pace occassioned by other students' needs for "simple" English skills. "The problem," he said, "is the English--they need another English class before this one--this is a class for more advanced students." The teacher was "great . . . patient. That's what you need, somebody who'll stick with you." Also impressed by the counselor, with whom he had worked several times; said the counselor "has a lot of information that's essential." Returned to the teachers when asked what he liked most about this program: "They care that you get what you came for." Like Student #1, brought up the math class when asked what he liked least about the program; said some of the students needed "the basics," and thus held the class up. This student, as noted above, felt a similar problem existed in his English class, and consequently suggested that the program be improved by offering two levels of math, and a more basic developmental English class for those (especially ESL) students who needed it.

STUDENT INTERVIEW #3: SUMMARY

This student adamantly refused to single out any lesson as more useful than another: "They all helped me: I gained a little bit from each lesson." Singled out, finally, the first practice test as a lesson that didn't work, because "I drew a blank on the first composition." Felt the teacher was very good, particularly given the challenge she faced: "English can be very boring; she wasn't." Said the counselor was "somewhat helpful," then explained that he had talked to the counselor several times, but has put off following up on the counselor's suggestions. Felt the best part of the program was the teachers. "I haven't been in school for 20-some years. For me to get out of bed on Saturday morning, there has to be some kind of motivation. The teachers understand this--they're the right teachers." Liked least about the program the mere 1/2 hour lunch break. As for changes in the program, this student wouldn't make any--though upon reflection, she suggested no English classes be held in the morning, as math was easier to "warm up" with and thus a good preface to English!

STUDENT INTERVIEW #4: SUMMARY

This student, too, found the lesson on outlining outstanding. "I hated English. Couldn't write a lick . . . but I learned to put thinking into words, outlining you know instead of just rambling on." The reading units didn't work as well as the writing units for this student: "I'm writing better, but I don't understand reading . . . previewing, and self-questioning especially are hard." Said the teacher was "good," and understanding, patient with people like her who "hadn't been in school in 30-some years." Hadn't worked with the counselor. Liked most about the program the small classes, and the fact that teachers took individual interest in "each student." She felt these aspects of the program had helped her build confidence and self-esteem. Her critique

of the program: "One Saturday for older people is just not enough. There's not enough time. Once a week is not enough. If the school kids need it every day, picture what we need!" Not surprisingly, given the above, the one change this student suggested was that the program be expanded: "more time."

STUDENT INTERVIEW #5: SUMMARY

This student was most impressed by the units on structuring an essay--the unit on outlining an essay, those on different types of paragraphs, and "how to close an essay so as to give it an extra boost." Also found the proofreading lessons useful, particularly the activity on run-on sentences and that on verb-tense consistency. Found the reading units less interesting, and LIFE AND DEATH downright boring, even offensive--felt "it does hospitals a disservice." Said the teachers were "both very nice ladies," but felt the second teacher "helped" more than the first--the former used the board more, which this student found helpful. Couldn't work with the counselor "because I work Saturdays." Overall, felt that this program gave her "what I think will get me into college;" moreover, thoroughly enjoyed all the science material, which she said refreshed her knowledge of biology. The part of the program she liked least was "getting up and coming down"--she works evenings, and has a young child, so frequently got only 3 or 4 hours sleep on class days. In concluding, said that the program had "been a success for me," and hoped nothing would be changed. She said the program should continue to be offered to other people, and continue to be free of charge, as that was the only way people in her situation could have a chance to get into college.

STUDENT INTERVIEW #6: SUMMARY

This student, too, cited outlining as "a real plus," both as a notetaking technique and as a means of organizing ideas "in a structural way" for essays. While he learned from the science material, he felt it was "hard": "if you can

get through that you can get through any other material," he exclaimed. The teachers were "very caring people" who gave "as much as possible in the short period of time we were together." This student saw the (first) counselor early on in the program, but hadn't found the time to see the second counselor, though the student felt counseling was an important part of the program: "I've never been to college . . . it's a frightening experience . . . I'd like to know more about it. Feels that this program "gives people the opportunity to become involved in further education, whereas more than likely they wouldn't get that opportunity at all." What he liked least about the program: that it was limited to one site. This student travels from Queens, and noted that, were his situation a little different (if his wife wasn't able and willing right now to stay home with their small children), he wouldn't have been able to participate in this program. Other than this, he felt that the program was "a terrific opportunity," that the information and presentation were "pretty much on time." "They don't baby you here," he concluded; "on the other hand, the instructors have given a great deal of themselves."

SUMMARY OF MAJOR THEMES AND ISSUES FROM INTERVIEWS

Of the three instructors and six students (3 identified by their teachers as above average, and 3 as average or below average in mastering the material) I interviewed, only one participant, an instructor, felt the curriculum needed radical revision, specifically, a revision brought about with the aid of a garbage can. A surprising unanimity of opinion emerged in the other eight interviews, both as to the overall effectiveness of the program, and concerning specific aspects of the program that might be improved. Because the dissatisfied instructor's critique of the curriulum amounted to a total dismissal of it, my summary will focus primarily on the other eight (i.e. usefully critical) interviews.

WRITING UNITS

Students and teachers agreed that the writing units were as a whole much more effective than the reading units; they singled out for special praise the unit on outlining an essay and the units on specific kinds of paragraphs (with the exception mentioned below).

Suggested Revisions :

1) Unit 22 (Writing Paragraphs: Compare/Contrast) was singled out by two teachers as one of the weakest units and one that simply didn't work. Clearly this Unit should be either revised or omitted.

2) Throughout the writing curriculum, more time needs to be spent on some of the basics of grammar, syntax, and punctuation. It seems to me that more work in these areas (especially sentence boundaries, subject-verb agreement, and verb-tense consistency) can be included in the curriculum in two ways: a) individual units can be revised to simply include one activity that addresses one of these areas, and b) a statement on the need for such work and suggestions of ways to include it in a variety of situations can be included in the Program Overview.

READING UNITS

As I noted above, teachers and students alike felt the reading units were less effective and/or "harder" than the writing units. Any discussion of the reading units, however, must be prefaced with several observations.

-first, most of these units worked with science materials, which are challenging reading for many college-educated students and certainly for the students in this program. This does not mean the texts should be changed--it is important to note that the very interviewees (teachers AND students) who spoke of how difficult the science materials were also felt that the students made genuine progress toward mastering these materials. Certainly additional work focussed on mastering the context of the science materials will better prepare these students for courses leading to an allied health degree; therefore I applaud the program's addition of a summer science workshop to the program, but see no need to dilute the science content of the program.

Second, and speaking generally, it is simply easier to teach students (and easier to learn) to write a five-paragraph essay than to teach students (and to develop) reading comprehension skills. In my experience, developmental reading classes offered for students who have yet to pass the CUNY Reading Assessment Test have much lower pass rates than do developmental writing classes offered for students who have yet to pass the CUNY Writing Assessment Test.

While I believe the perceived weakness of the reading units relative to the writing units derives in good measure from the factors cited above, it is nonetheless clear that the reading component of this curriculum can be improved. This improvement should take two forms:

1) after much thought, I have come to agree with the opinion voiced by teachers and students that this curriculum overemphasizes self-questioning as a

reading comprehension strategy. I know it is essential to reading comprehension, but I have come to agree with the teacher who observed that, as it is presented throughout this curriculum, "it makes reading seem too technical." Even good readers and conscientious students employ these strategies (previewing and self-questioning) much less methodically, and much more informally, than this curriculum suggests should be the case. Certainly the units in which these techniques are first taught should be kept; once these strategies have been introduced and practiced in these units, however, they should be emphasized less throughout the remaining reading units. Moreover, students should be taught to use these techniques when they are having trouble understanding what they are reading (which is precisely the way most readers use them), not necessarily BEFORE they begin every reading assignment. Indeed, suggesting that all reading should begin with previewing and self-questioning not only makes ALL reading seem potentially daunting and necessarily incredibly time-consuming, but is also, simply, wrong. Different approaches are perfectly appropriate to different kinds of reading, which brings me to my second suggestion (actually, the teachers' suggestion, with which I agree).

2) While the science texts SHOULD NOT BE REPLACED, other KINDS of reading should be incorporated into the curriculum--"subway reading," as one teacher put it. LIFE AND DEATH comprised a step in this direction; that the students' reaction to this was frequently negative does not mean it should be abandoned, but merely reconsidered. Why not try other kinds of reading that would complement the science texts, broaden the students' exposure to different types of literature, but not offer them what they perceived as a watered-down version of their lives as workers. Some suggestions: William Carlos Williams' A DOCTOR'S STORIES, Richard Seltzer's MORTAL LESSONS, Tolstoy's THE DEATH OF IVAN ILLYCH, MOTHERWIT: THE STORY OF AN ALABAMA MIDWIFE, poems (WCW's, among others), even Kafka's METAMORPHOSIS (read as a metaphor for the alienating

effects of illness), and Audre Lorde's THE CANCER JOURNALS. Perhaps each teacher could select a few texts from a list of suggested readings, and thus shape the curriculum to their interests without diluting its coherence as a health-education curriculum. In short, include imaginative literature--even poetry. As long as these students are being encouraged to read, why not give them the best?

By including more various reading in this curriculum, I believe the program will enable students to better grasp the ways in which self-questioning can be a useful but need not always be a "technical" reading strategy; I also think including such reading will more effectively help these students in their desired transformation from non-readers to skilled and habitual readers.

FINAL COMMENTS ON INTERVIEWS

-in spite of the fact that he came into the program in the middle of the semester, the second counselor was the RIGHT counselor; the teachers found him a valuable resource, and the students who worked with him praised him.

-the true value of this program can be traced, I believe, not merely in the satisfaction students and teachers expressed about students' progress in this program, but also in the students' comments when asked to suggest how this program could be improved. Invariably, they suggested expanding it in some way: specifically, for more hours, over a longer period of time, and to more sites. It should be noted that almost every student, in talking about the program, spoke of it as the one window of opportunity in the crowded quarters in which they live. Each of the six students, some more explicitly than others, spoke of how hard it was to fit this program into their schedule of work, commuting, and family responsibilities. Yet, far from feeling this program demanded too much of them, each of them described the program as a valuable and compelling experience that they felt incredibly lucky ("blessed," said

several) to have had the chance to participate in.

FINAL COMMENTS ON THE CLC/CWE/CUNY COLLEGE PREPARATION PROGRAM

Two issues remain to be discussed, both of them critical to a final evaluation of this program, and both of them addressed in the teachers' interviews: a) the ambitious and potentially conflicting goals this curriculum sets for the students, and b) the appropriateness of this curriculum for the students in the program

a) Program Goals. The instructor who felt the curriculum "did not work well at all" described the several goals of this program (to familiarize the students with science materials; to develop students' skills in reading, writing, and mathematics; and to prepare students to pass the CUNY Freshman Skills Assessment Tests) as necessarily conflicting goals, and furthermore as goals that spread teachers and students so thin that students' ability to master any one of these three areas was seriously undermined. Based on my review of the curriculum, my observation of the classes, and my interviews with students and the other two teachers, I disagree. Not one of the students, including the two students I interviewed who were in this teacher's class, saw the several goals as conflicting or confusing. And while each of the other two teachers expressed concern about the several goals of the program, both emphasized the considerable extent to which reading and writing skills were successfully integrated in this curriculum; both acknowledged the difficulty of the science texts but went on to affirm the use of these texts (as did the student who spoke of how hard the science readings were, then exclaimed proudly "if you can get through that you can get through any material!"). Which brings us to the one conflict that is real and, I believe, unavoidable: that between helping students develop the myriad skills critical to academic success (critical thinking, reading comprehension, writing, and study skills), and ensuring

that students will pass the CUNY Assessment Tests and thus be ready to enter credit-bearing college courses when they complete this college preparatory program. Like all such tests, these tests have drawbacks: doing well on them may indicate but in no way guarantees a student can do college-level work, particularly in a science field. Nor are FSAT scores the most accurate guage of students' intellectual development. This said, I hasten to add that I have never yet met a teacher of developmental/remedial reading and/or writing (and I include myself in this category) who has not rued the force exerted by these tests as one that distracts students and teachers from the REAL purpose of the course: the development of reading and/or writing skills, a development absolutely concomitant with students' intellectual development. The conflict between these two goals--ensuring that students pass the test, and enabling students' intellectual development and development of basic skills--cannot be avoided; it is real; however, I would argue that it is not entirely negative. These students must pass these tests; this is an extremely clear goal, and works to motivate students (and, in my experience, teachers as well) to keep pushing, as well as to force students and teachers alike to keep their feet on the ground while they stretch toward the sky--i.e. college. These students, and consequently these teachers, are working against the odds. These tests stand, in a way, for the "odds": they are a blatent obstacle symbolic of the many obstacles these students must overcome if they are to enter and successfully complete college. If a ladder exists that students can lean against this gate and climb from the present to the much better future they envision, this program comprises such a ladder.

b) Appropriateness of Curriculum **For** Students. All three teachers felt that the curriculum assumed a level of literacy in the students that they did not in fact have. While the one teacher saw the science texts as the heart

of the problem, the other two did not. Instead, both suggested that the curriculum could be revised so as to further emphasize "the basics"--in the writing units, more emphasis on sentence boundaries, subject-verb agreement, etc. (keep in mind that some of the most "basic" units, those on specific kinds of paragraphs, on outlining, and even on subject-verb agreement, were the units singled out for praise by students as well as teachers); in the reading units, less emphasis on previewing and self-questioning and more emphasis on simply READING MORE. As the preceding pages make clear, I concur with their suggestions, and believe the curriculum can be revised easily to better meet the students' need for "the basics."

In concluding, then, I would like to note that this is a challenging curriculum, one that perhaps demands as much of the teachers as of the students. Clearly, the students and two at least of the three teachers I observed and interviewed rose to the challenges posed by this program. The revisions suggested above should further shape this curriculum to the students' needs; the final suggestion I have addresses the teachers' needs: a faculty development component should be added to this program. It seems to me that the teachers I spoke with had created this component on their own, and I attribute much of the success of their efforts to their willingness to learn from their students and from one another as they moved through this program. It seems to me that these teachers, for the most part, successfully bridged what one teacher described as "the gap" between the curriculum and the students' literacy levels. This gap is real, and reflects not a failure of the curriculum but the reality: the students in this program are embarking on an incredibly difficult feat. A feat, it is important to point out, they felt they had "pulled off"--"regardless," one student told me, "of whether I pass those tests or not. I know now I'm going to make it to college soon." Consequently, I believe the informal faculty

development work that actually took place and contributed significantly to this program's success should be formalized, perhaps in the guize of regular workshops in which instructors preview and fine-tune the lessons in the curriculum, and in doing so master the material themselves as they shape it to the individual needs of their students. Two cases in point: two of the curriculum units that I singled out for special praise in my evaluation of the curriculum, the unit on compare/contrast paragraphs and the student editing workshop, were both identified by teachers as units that didn't work, the former because the examples in LIFE AND DEATH (which I didn't read) weren't clear, the second because the language was too sophisticated for the students. No amount of work on the curriculum can prevent such problems; ONLY the teachers are in a position to identify and resolve (change the wording of the editing sheet, find other examples of compare/contrast paragraphs that ARE clear) such problems. A formal faculty development component would provide the perfect vehicle for this work, as well as comprise a formal acknowledgement of the teacher's contribution to and integration into this holistic program.

Report submitted: August 1, 1991

THE CLC/CWE/CUNY COLLEGE PREPARATION PROGRAM: A FORMATIVE EVALUATION

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This report deals with the mathematics component of the CLC/CWE/CUNY College Preparation Program which ran during most of the 1990-1991 academic year. The program, which had as its goal the teaching of developmental mathematics through a health-care applications approach, was in some ways traditional and in other ways experimental. While the curriculum was generally the standard basic math content, emphasis was placed on such innovative topics as health applications and estimation skills. Similarly, the pedagogical techniques employed ranged from conventional lecture-discussion to non-traditional collaborative learning strategies.

In this report, we examine major aspects of the program, focusing on the specially developed curricular materials designed to supplement the Goozner text. Since we are concerned here with a formative evaluation of the program, we stress suggestions for its improvement rather than giving any final assessment of its effectiveness.

The report is divided into three sections:

- Views of the Math Instructors
- Views of the Students
- Conclusions and Recommendations

In addition, various related documents are appended.

VIEWS OF THE MATH INSTRUCTORS

As part of the program assessment, I interviewed the three teachers who taught math in the program. Their view of the curricular materials should carry particular weight, since they have taught from these materials.

For each instructor, the discussion generally followed the outline appended to this report.

To begin with, I asked each instructor what aspect of the program he or she liked the most. One instructor said that what most impressed him was the students -- especially those who remained in the program -- both in terms of their enthusiasm for the program and their gratitude to the teachers. The other two instructors praised the collaborative learning strategies which they were encouraged to employ; students eagerly helped one another, particularly when the ability level of students varied within each group.

I then asked the instructors to what extent, in their view, their students learned the material. One replied that all students

who attended fairly regularly learned the basic math skills, and most who had experienced fear or discomfort with mathematics previously felt more at ease and more confident in their ability to learn. This was particularly impressive in the view of another instructor who pointed out that the students were very unprepared when they entered the program -- a score of 5 out of 20 on a pretest was typical.

When asked what they liked least about the program or what changes they would recommend, one teacher severely criticized the student handouts, especially because they contain problems which assume that students possess skills or knowledge which they in fact lack. He stressed the need in mathematics instruction for greater systemization so that topics are covered in a logical order. He also felt that the handouts were too demanding in terms of the reasoning ability expected. He went on to criticize the high student drop-out rate, as well as the scheduling of classes, noting that meeting only once a week meant too much time between classes. He noted that more time was needed for students to develop number sense for estimation problems, and that the collaborative learning discussion topics were generally too difficult for most students in each group. As for tests, this instructor criticized the exam items for not being graduated in difficulty, and recommended giving the real CUNY Math Assessment Test (CMAT) at the end of the course, preferably counting for CUNY certification.

Another instructor criticized the program's exams because they contained so many errors, and argued for more realistic exercises of interest to nurses rather than hospital administrators.

The third instructor suggested that some counseling strategies be developed for students who might be dissatisfied with the program, or who might be about to drop out. He also criticized the frequent errors on tests, and argued for more frequent testing.

When asked which of their lessons they felt had been particularly effective, two instructors singled out their lessons on graphs. One instructor noted that students had found this content challenging, but had been especially active while discussing it and so eventually learned it well. The other noted that students had had great difficulty with this material because they had not yet mastered the topic of percent. The third instructor praised his lesson on percents, noting that he had presented several different approaches and had discussed some highly motivating practical problems.

Finally, the instructors were asked to identify their less effective classes. Only one instructor replied, singling out his algebra lessons as being not particularly effective -- superficial in his view -- because there was only enough time to give rules rather than to develop understanding. He recommended that algebra be introduced earlier in the course.

VIEWS OF THE STUDENTS

In order to get a student perspective on how effective the program was, I interviewed nine students -- three taught by each math instructor. Although the students were volunteers, I have no reason to believe that their views differ markedly from those of other students. These discussions followed the outline appended to this report.

The overriding impression which the students gave was that they liked the program enormously. One noted that her brain used to "close up" in previous math classes because she had never understood what was going on; now she does. Another said that to her, the eight months "went flying."

All the students liked their math instructors very much, describing them as very good, well organized, very patient, good at explaining, very encouraging, good at fielding questions, and very sympathetic. One student called her instructor the best teacher she had had in years. Another noted that there had been a change in staffing in mid-year; she preferred her second teacher, noting that the first teacher jumped around a lot, and was not as well organized as the second.

As for their counselor, several students found him to be very nice, and pointed to his two workshops on financial aid and college

admissions as being particularly informative. One student noted that both she and the counselor were Hispanic; she saw this as positive, because the counselor had already faced problems of the type which would confront her and so could give her good advice. Another student pointed out that there had been a change in counselor midway through the year, but that both were helpful, and addressed problems of lack of student confidence, information on CUNY, the GED, and college admissions, and also where to go for additional information. However, one student was very critical of the counselor; she had spoken to him only once, and didn't find him very helpful.

When asked what they liked most about the program, most students singled out their teachers for praise. However several students also spoke positively about both the textbook and the especially developed handouts. One student praised the time and location of her courses, as well as the fairness of the quizzes. Another said that she had enjoyed meeting her classmates, and making friends. Several noted that the program provided them a kind of transition to college, and that they now felt more confident and more ready for college.

As for criticisms or possible changes in the program if it were run again next year, a number of students came up with thoughtful points.

Several of their suggestions dealt with course scheduling. One student noted that she had not liked attending on Saturday, although she was unable to think of an alternative time which would be preferable. Several students thought that the program was too short and too rushed, and that it would be nice if the math course met more hours per week; she also admitted, however, that this would be difficult because of job constraints. Another student wanted the math course to meet twice a week -- say Saturday and a weekday -- because it was so easy to forget the material after a whole week. And still another suggested that the math course be offered in the evening.

Not all suggestions dealt with time. Two students noted that their instructor hardly used the textbook, relying almost exclusively on the handouts. Furthermore, these students said that they had repeatedly had difficulty finding the topic which the instructor was discussing in the textbook. Another said that the program should have evaluated entering students with some sort of placement mechanism, and then assigned them to a higher or lower math course, depending on their needs. Another criticized the practice sheets, arguing that they should contain more explanations; this student preferred the textbook which seemed more comprehensive, although she pointed out that there was insufficient algebra even in the text. And a final student suggested that the course be given closer to home in the Bronx, noting that this would be more convenient for about half the class.

When asked which lessons they enjoyed and learned from the most, four students chose algebra, noting that this was just a review for them, although a very effective one. Another chose graphing, and two chose fractions, noting that their instructors explained this material especially well. A final student singled out percent -- generally agreed to be a difficult topic -- but which she was able to learn well in class.

On the other hand, when asked which lessons they enjoyed and learned from the least, most declined to identify any lessons, saying that they liked all of them. However several chose the lesson on algebra, noting that the material was difficult, that they had not learned it previously, and that insufficient class time was spent on it.

It should be noted that my conversations with these students took place near the very end of their course, after a significant number of students had already dropped out. To gauge whether the dropouts might have been more critical of the program than the students interviewed, I asked the interviewees why they thought some of their classmates had stopped attending. A typical response was that even the dropouts liked the program, but that the obligations of their personal lives made continuance for them too much of a strain. However other students thought that the dropouts

were not sufficiently committed to doing their homework, or just couldn't keep up for one reason or another.

CONCLUSIONS AND RECOMMENDATIONS

Throughout much of the past year, I have had the opportunity to review all the newly developed curricular materials. My overall reaction to these materials, and to the program generally, is that they represent a worthwhile experiment in line with current National Council of Teachers of Mathematics recommendations to stress applications in math instruction.

However no educational initiative is without flaws. Elsewhere, I have identified various concerns which I have had regarding certain details of the curricular materials. For one thing, I have identified numerous typos in the manuscript. More importantly, I have suggested a good deal of rewording in the curricular materials so as to clarify the problems. While many of the exercises in the curricular materials are excellent -- interesting, provocative, and involving, some are artificial or confusing. My understanding is that many of my suggestions have been accepted and implemented by the curricular developer.

The most serious criticism of the curricular materials, particularly the student handout, is that some of the exercises assume pre-requisite knowledge which many students lack. As an

example, I quote my own review of the topic of Graphs in Units 1 and 2:

> The decision to place the important topic of graphs at the beginning of the curriculum, while unusual, is defensible, but only if the examples require no pre-requisite knowledge of material to be covered subsequently. However Graph D, for example, requires understanding not only of percent but also of *fractions of a percent*, a notoriously difficult topic.
>
> Recommendation: Either move graphs after percent in the syllabus, or confine examples of graphs to problems involving only whole numbers.

It's worth noting that the problem of improperly sequenced exercises was repeatedly raised by the math instructors reflecting on their experience in teaching the course.

In addition to poring over the specially developed curricular materials, I had the opportunity to observe the three math instructors at work. They all are "pros" -- highly experienced, competent, and dedicated teachers. The classes which I observed were all very good -- and one I would rate as outstanding. Explanations were clear and rigorous, teacher-student interaction extensive, and the mood which the instructors set very positive.

A point needs to be made about the physical setting of the math classes. As I've indicated elsewhere, there is insufficient board space in the classrooms in which the math classes are being

taught. It is important for a student to be able to look back and compare current boardwork with recent boardwork, which is only possible if there is sufficient board space.

Recommendation 1. If funding is available, the program should be continued, and if possible, institutionalized. The program is a worthwhile experiment which can have a significant and positive impact on participating students.

Recommendation 2. Since faculty play a key role in the effectiveness of the program, great care should again be taken in staffing courses.

Recommendation 3. The newly developed curricular materials, in conjunction with a standard math text, should again be employed. But great care must be taken in improving the wording of the exercises on the student handouts, and the questions on the tests.

Recommendation 4. The sequencing of the units in the curricular materials should be re-considered. No units should be covered unless pre-requisite topics have already been covered.

Recommendation 5. Greater attention should be paid to communicating to students how math topics covered relate to the textbook.

Recommendation 6. The use of a math placement test should be considered. A placement mechanism might, for example, split students between those who need an intensive review of arithmetic, and those who need a light review of arithmetic combined with an extensive introduction to algebra.

Recommendation 7. A mechanism should be put in place to identify students who are near to dropping out, and counsel them appropriately.

Recommendation 8. Consideration should be given to alternative scheduling and site configurations for the program.

Recommendation 9. Math classes should be held in classrooms with sufficient board space.

APPENDICES

CLC/CWE/CUNY College Preparation Program

Teacher Interview

This interview is entirely confidential. Your name will not be used in any way.

1. Describe one or two lessons from the curriculum that you feel were particularly effective.

2. Describe one or two lessons from the curriculum that you feel were not effective.

3. What do you like most about the program?

4. What do you like least about the program?

5. What changes would be needed to make this program better?

6. To what extent do you think that students in the program learned?

Additional comments:

CLC/CWE/CUNY College Preparation Program

Student Interview

This interview is entirely confidential. Your name will not be used in any way, and student responses will be grouped.

1. Tell me about one or two lessons that you enjoyed a lot and that you learned a lot from.

2. Tell me about one or two lessons that you didn't learn from.

3. What do you think of your teacher?

4. What do you think of your counselor?

5. What did you like MOST about the program?

6. What do you like LEAST about the program?

7. What CHANGES would be needed to make this program better?

8. Do you have any additional comments?

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Writing Assessment

The following exercise assesses your ability to write a short essay at the college preparatory level. **Read the following passage**.

A nurse is caring for a woman who has been seriously injured in a fire. The woman's son, who was also injured in the fire, is admitted to another unit of the hospital and dies almost immediately. The woman constantly questions the nurse about her son. The physician instructs the nurse not to tell the client that her son has died but to invent answers to her questions. The physician gives no reason.

The nurse wonders whether she should invent answers for the client, report the matter to the charge nurse, or tell the client the truth. The nurse asks you what you think she should do.

Write an essay of one to two pages. In your essay, tell the nurse what you think she should do, and why you think it. Try to persuade her that you are right.

Note: The ethical dilemma was drawn from Kozier, B. & Erb, G. (1987). Fundamentals of Nursing, 3rd Ed. Menlo Park, CA: Addison-Wesley. (p. 191).

TEACHER RATING FORM

CWE/CLC/CUNY College Preparation Program

Saturday - Group A

9 a.m. to 12 noon: Reading/Writing Instructor: Barnet Schecter

1 to 4 p.m.: Math Instructor: David Lorde

Student's Name	A	B	C	D	E	F	G

Worker Literacy Program: Teacher Ratings

- Made by teacher three times during program: mid December, mid March, end May.

- 5-point scale based on how well the student is mastering what is being taught.

    1 = Below acceptable level of mastery

    2 = Minimally acceptable level of mastery

    3 = Acceptable level of mastery

    4 = Strong mastery

    5 = Excellent mastery

- Skills rated by teachers (letters correspond to columns on Teacher Rating Form)

    A. Reading Comprehension
    B. Writing Skills
    C. Study Skills (e.g., note-taking, previewing)
    D. Critical Thinking Related to Reading and Writing, including ability to discuss and analyze material in class discussions
    E. Math Concepts
    F. Math Calculation
    G. Critical Thinking Related to Math, including ability to discuss and analyze material in class discussions

CLC/CWE/CUNY College Preparation Program

INFORMATION SURVEY

To understand the needs of college preparation students, we are asking you to answer the following questions. All information is entirely confidential.

Name _____ Age _____

1. What is your first language? _____

2. What language do you speak at home? _____

3. In what country did you attend high school? _____

4. In what language did you receive your high school education? _____.

5. For how many years did you attend high school? _____

6. How many years has it been since you attended high school? _____

7. Have you ever attended college? Yes ___ No ___

   If yes, please list some courses you took _____

   _____

8. Have you attended another education program? Yes ___ No___

   If yes, what kind of program was it? G.E.D.___ E.S.L. ___ Other ____

   How long has it been since you attended? _____

9. Do you have children? Yes ___ No ___

   If yes, how many? ____ How many are younger than school age? ___

   How many attend: Elementary School ___ Junior High School ___

   High School ___ College ___ Other school (specify) _____

10. What kind of job do you hope to get in the future? _____

CLC/CWE/CUNY College Preparation Program

PLEASE ANSWER ALL QUESTIONS THAT ARE APPLICABLE TO YOU. YOUR INFORMATION WILL HELP US TO PLAN FUTURE PROGRAMS. A STAMPED, ADDRESSED ENVELOPE IS ENCLOSED.

Name (print) _____ Today's date _____

If you are currently attending college:

Name of college _____ Entry date _____

Course titles:

Credit-bearing course(s) _____

_____

Non-credit bearing course(s) _____

_____

How are you doing in your course(s)? (circle a number)

Very well			Average			Much difficulty
1	2	3	4	5	6	7

If you have taken CUNY Assessment Tests:

Reading Test: Approximate date _____ Score _____

Writing Test: Approximate date _____ Score _____

Math Test: Approximate date _____ Score _____

OVER

If you are not in college now but plan to attend in the future:

Have you applied? Yes ____ No ____

If no: When do you plan to apply? Approx. date _____

If yes: When do you expect to start college? Approx. date _____

If you attended the college preparation program:

Was the CLC/CWE/CUNY College Preparation Program helpful to you? Comments:

_____

_____

_____

_____

PLEASE RETURN YOUR COMPLETED FORM IN THE ENCLOSED STAMPED, ADDRESSED ENVELOPE AS SOON AS POSSIBLE. THANK YOU.

(Address: CASE, CUNY Graduate School, 25 W. 43rd Street, New York, NY 10036)

CLC/CWE/CUNY College Preparation Program

FOLLOW-UP INTERVIEW

Name _____ Union _____ Date _____

Phone ( ) _____ ( ) _____

Status: Completed ____ Did not complete ___ Did not attend ___

1. **COLLEGE APPLICATION**

(a) Have you applied to college? Yes ___ No ___

If you have applied to college:

(b) Placement tests: Date Score (if known)

Reading _____ _____

Writing _____ _____

Math _____ _____

(c) College _____

(d) Program _____

(e) Expected entry date: Fall 1992 ____ Spring 1992 _____

Other ____ (specify) _____

(f) How will you finance your studies? _____

(g) Did you take or are you taking any immersion/refresher courses in college this summer? Yes ___ No___

If you have taken a course:

subject matter: _____

college _____

number of weeks of course _____

If you have not applied to college:

(h) Why did you decide not to apply?_____

(i) Do you plan to apply in the future? Yes ___ No ___

If yes:

(j) What type of program would you be interested in? _____

(k) When do you think you might apply? _____

(l) Do you have any other educational plans? _____

2. **CONCURRENT COLLEGE ATTENDANCE**

(a) Were you attending any college courses while you were in our program?

Yes ___ No ___

If yes:

(b) Course title(s): _____

(c) What was your reason for attending the college prep program?_____

_____

3. **BACKGROUND**

(a) Date of birth _____ Age _____

(b) Social Security Number _____

(c) What was the highest grade you completed in high school (when you were younger - not GED classes)? _____

(d) Where was your high school (when you were younger - not GED)?

In the U.S. ___ Abroad ___

(e) Do you have a: GED ___ Regular h.s. diploma ___ Both ___

(f) First language _____

(g) Language spoken at home _____

(h) Had you attended any college courses before you entered our program last October? Yes ___ No ___

If yes, give titles or subject areas

(i) Remedial/developmental courses _____

(j) Credit courses _____

(k) How many college credits have you earned? _____

4. YOUR RESPONSIBILITY FOR OTHERS

(a) Are you a single head of household or sole provider? Yes ___ No ___

(b) How many children do you look after who are below 18 years of age, whether they are your own or others'. _____

(c) How many older people do you look after? _____

(d) Other people you look after (specify and say how many) _____

5. AMOUNT OF SUPPORT FROM YOUR FAMILY

(a) Was your family inconvenienced by your coming to classes?

Yes ___ No ___

(b) How much support did your family give you to attend classes?

Alot ___ A little ___ No support ___

6. YOUR OPINIONS OF THE PROGRAM

(a) Geographic location: Convenient ___ Not convenient ___

(b) Days and times of classes: Convenient ___ Not convenient ___

(c) Classwork: Reading-writing. Right level ___ Too difficult ___ Too easy ___

(d) Classwork: Math. Right level ___ Too difficult ___ Too easy ___

(e) Pace: Reading-writing: Right pace ___ Too fast ___ Too slow ___

(f) Pace: Math: Right pace ___ Too fast ___ Too slow ___

(g) We used health-related rather than more general material in the classes.

Was this: Helpful ___ Not helpful ___

7. **TEST SCORES**

NOTE: Ask non-completers whether they stayed long enough to take the tests before asking these questions.

(a) How did you feel when you got the scores for your first tests?

Encouraged ___ Discouraged ___ Neither ___ Can't remember ___

(b) Did you find on-going testing helpful in the program?

Helpful ____ Not helpful ____

8. **EFFECT OF THE PROGRAM**

(a) Did your feelings about yourself as a student change as a result of the program? For better ____ For worse _____ No change _____

(b) What did you hope to get out of the program when you started? _____

_____

(c) Did you attain this? Yes ___ No ___

9. **NON-COMPLETERS ONLY** (student's status shown at beginning of this form)

Our records show that you stopped attending class before the program ended.

(a) Why did you leave the program?

Geographic location was inconvenient ___

Days and/or times of classes did not fit in with my work schedule ___

Family matters ___

Personal health ___

Something about the classwork ___ (Specify) _____

Pace of instruction ___ Too fast ___ Too slow ___

Other ___ (specify and give further information) _____

_____

(b) Would you re-enroll? Yes ___ No ___

10. **NON-ATTENDERS ONLY**

Our records show that you applied for the college prep program last summer and were accepted. Why didn't you attend?

Geographic location was inconvenient ___

Days and/or times of classes did not fit in with my work schedule ___

Family matters ___

Personal health ___

Other ___ (specify) _____

The Graduate School and University Center
of The City University of New York

Center for Advanced Study in Education
Institute for Research and Development in Occupational Education
33 West 42 Street, New York, N.Y. 10036
212 642-2942 FAX 212 719-2488

WORKPLACE LITERACY CURRICULUM MATERIALS FOR COLLEGE PREPARATION OF HEALTH CARE WORKERS

Three curriculum products have been prepared by CASE of the City University of New York Graduate School, in a university-labor partnership funded by the U.S. Department of Education. Project participants were paraprofessional health care workers who had GED or regular high school diplomas and were preparing for 2-year college programs such as nursing and health specializations.

Reading and Writing Curriculum Guide, Mathematics Curriculum Guide, and Videotape Science Lectures and Viewing Guide

The materials focus on specific reading, writing and math skills, emphasize self-reflection on learning processes, and incorporate collaborative learning methods. Instructional units for reading and writing are designed to be used with specific texts. Other texts could be substituted. The math and video materials stand alone. All three products could be used as models for further curriculum development in workplace literacy and other adult education programs.

Reading and Writing Curriculum Guide (240 pages)

- 48 instructional units, with student handouts
- Keyed to the following texts:
  Gylys, B.A. & Wedding, M.E. (1988). Medical Terminology: A Systems Approach. Philadelphia: F.A. Davis Company. Chapters 1-4.
  Tortora, G.J. & Anagnostakos, N.P. (1990). Principles of Anatomy and Physiology. New York: Harper & Row Publishers. Chapters 1-6.
  Ucko, D.A. (1986). Living Chemistry: An Introduction to General, Organic, and Biological Chemistry. San Diego: Harcourt Brace Jovanovich. Chapters 1-3.
  Yalof, I. (1988). Life and Death: The Story of a Hospital. New York: Fawcett Crest.
  These texts are not provided. Programs could purchase them or could apply the instructional objectives and activities in the curriculum guide to other texts.
- Wide variety of college reading, writing, listening, study and test taking skills
- Suggestions for literacy assessment

Mathematics Curriculum Guide (375 pages)

- 56 units, with student handouts
- 4 tests, with answer keys
- Based on health care job practices and college level, health related math
- Each unit includes vocabulary and writing activities
- Teaches estimation and calculation
- Brief assessment in each unit
- Page references in each unit for supplementary instruction and review from: Goozner, C. (1988). Computational Skills for College Students, 2nd Edition. New York: Amsco (not provided with curriculum guide)

Videotape Science Lectures and Viewing Guide (3 videotapes and 78 page guide)

- 6 sample biology and chemistry lectures, each 35-45 minutes long, given by college faculty
- Lecture titles:
  Components of the Cell, Tissues, Anatomical Terms, Metric Measurement, The Periodic Table, and Covalent Bonding
- Viewing guide contains step by step learning activities focusing on reading, writing, listening and study skills, and self-monitoring of learning
- Supplements reading and writing curriculum guide described above
- Lecture outlines, text references, tests, and answers provided for each lecture

All materials are available on a cost-recovery basis. Prepayment required. Ordering information on next page. For further information, please call Dr. Dolores Perin at (212) 642-2937.

WORKPLACE LITERACY CURRICULUM MATERIALS
FOR COLLEGE PREPARATION OF HEALTH CARE WORKERS

ORDERING INFORMATION

The three curriculum products below, described on the previous pages, are available on a cost-recovery basis. Prices include postage and handling.

- Reading and Writing Curriculum Guide. 240 pages, with binder. $57.50
- Mathematics Curriculum Guide. 375 pages, with binder. $65.00
- Science Video Package. 3 videotapes and 78 page guide, spiral bound. $60.00

20% discount on purchase of set of three products - total price $146.00

Prepayment is required. To order, complete and return the tear-off below, along with a check for the appropriate amount, made out to IRDOE/RF Account #770006. Mail the tear-off and check to Dr. Dolores Perin, CASE/IRDOE, CUNY Graduate School, 25 West 43rd Street, Room 620, New York, NY10036. Call (212) 642-2937 for further information.

ORDER FORM

To: Dr. Dolores Perin, CASE, CUNY Graduate School, 25 W. 43rd Street, Room 620, New York, NY 10036

Please send the following workplace literacy curriculum materials:

_____ copies Reading and Writing Curriculum Guide: $57.50 each
_____ copies Mathematics Curriculum Guide: $65.00 each
_____ copies Science Video Package (3 videotapes and Viewing Guide: $60.00 package
_____ full sets: $146.00 each set

A check for $ _____, made out to IRDOE/RF Account # 770006, is enclosed (postage and handling included). Federal Vendor Code: IRS 131-988-190N

Your Name: _____

Institution: _____

Address: _____

_____ Phone: _____

PREPAYMENT REQUIRED ON ALL ORDERS

CLC/CWE/CUNY College Preparation Program

COUNSELING - INTAKE

Name _____ Date _____

Class attended (check one) Saturday ___ (Group: A ___ B___ C___ D___)

Tues./Thurs. morning ___ Tues./Thurs. evening ___

Address _____ _____ Apt. ____

Borough _____ Zip _____

Phone (Home) ( ) _____ (Work) ( ) _____

Union _____ Job Title _____

Type of high school diploma (check one)

High School Diploma ___ G.E.D. Certificate ___

Other ___ (Describe) _____

If high school diploma obtained in country other than U.S., specify:

_____

Comments/Follow-up: _____

_____

_____

_____

_____

_____

_____

CLC/CWE/CUNY College Preparation Program

COUNSELING LOG

NOTE: This log is to be completed jointly by the student and counselor before the end of the counseling session.

Name _____ Date _____

Class attended (check one) Saturday ___ (Group: A___ B___ C___ D___)

Tues./Thurs. morning ___ Tues./Thurs. evening ___

Issues discussed: _____

_____

_____

_____

Next steps: The student will do the following: _____

_____

_____

_____

The counselor will do the following: _____

_____

_____

_____

CLC/CWE/CUNY College Preparation Program COUNSELING FORM

STUDENT-COUNSELOR INTERCOMMUNICATION

Date: _____

To: Miguel Berrios, Program Counselor

From (PRINT NAME): _____

Phone number: Day ( )_____ Evening ( ) _____

I would like to make an appointment with you on the date circled below.

___ I would like a Tuesday or Thursday evening appointment

ADDRESS: 797 Eighth Avenue, between 48th and 49th Street, Manhattan

DATE (circle one) June 25 July 11 July 16

TIME: (between 6:00 and 7:00 p.m. only) _____

___ I would like a Friday daytime appointment

ADDRESS: 300 West 43rd Street, 4th floor, near 8th Avenue, Manhattan

DATE (circle one) June 21 June 28 July 12 July 19

July 26 August 2 August 9 August 16

TIME:(between 9:30 a.m. and 1:30 p.m. only) _____

RETURN TO: Dolores Perin, CASE, CUNY Graduate School, 25 W. 43rd Street, Room 620, New York, NY 10036

COUNSELING FORM

CLC/CWE/CUNY College Preparation Program

STUDENT-COUNSELOR INTERCOMMUNICATION

Date: _____

To. Miguel Berrios, Program Counselor

From: _____

Phone number: Day ( )_____ Evening ( ) _____

Message: (check if applicable) ____

I would like to make an appointment with you at 99 Hudson Street as follows:

Date: Saturday, _____

Time: _____(betw. 9:30 am and 1:30 pm only)

For those not returning to class: THE REASON WHY I AM NOT COMING BACK

IS: _____

_____

_____

_____

_____

_____

_____

WORKPLACE LITERACY INSTRUCTION FOR COLLEGE PREPARATION OF HEALTH CARE WORKERS

U.S. DEPARTMENT OF EDUCATION GRANT AWARD #V198A00214

PERFORMANCE REPORT

Education Partner: CASE Institute for Research and Development in Occupational Education of the Graduate School and University Center of the City University of New York.

Labor Partner: New York City Central Labor Council, AFL-CIO Workplace Literacy Program.

Planned Objectives Accomplished

The education-labor partnership was successful in accomplishing project objectives, as follows:

- Planned and developed model worker literacy program to prepare health care paraprofessionals for college
- Developed curriculum to teach reading, writing and math skills, contextualized in health care, incorporating study skills and critical thinking skills
- Designed classroom methodology, incorporating collaborative learning, appropriate for adult workers, and out-of-class study groups and supplementary videotapes
- Accepted 153 health care paraprofessionals to the program
- Provided worker literacy training utilizing the curriculum and teaching methodologies developed by project staff
- Developed and administered instruments to measure literacy gains
- Conducted both formative and summative evaluation
- Disseminated the worker literacy model to the field

Change to Proposal Objectives

It was originally intended to develop curricula for two separate groups, workers preparing for degree programs and those

preparing for non-degree programs in colleges. However, during the literacy task analysis it was found that it would be advantageous for all participants to be exposed to the same curriculum, because there was a very large degree of overlap in the literacy needs of the two groups. Therefore, the project developed materials for use by all participants.

Objective Not Accomplished

It was intended that formal, written Individualized Educational Plans would be drawn up for each student. This activity turned out not to be feasible, given the number of activities that had to be commenced simultaneously: running a new program with new teachers and new students with a new curriculum, all of which naturally contained "bugs" that had to be ironed out. The formal I.E.P.'s could not be given the same priority as the other activities. However, all teachers individualized instruction, especially as time went on and they became more and more aware of students' special needs.

Change in Target Date for Beginning of Instruction

While screening and counseling began as planned, the classes began approximately six weeks later than expected, in order to be in line with the schedule of the labor partner's other educational programs and its provision of matching funds. To accommodate this change in target date, the project applied for and was granted a no-cost time extension.

Change in Project Staff

Three months into the program, the original counselor decided to leave the project for personal reasons. A new counselor, who stayed until the end of the project, was hired to replace her.

Dissemination

The project was disseminated widely, through two publications, several presentations at national conferences, and articles and announcements in national newsletters. Curriculum materials were submitted to a national clearinghouse, and a set was given to the federal Program Officer. Dissemination activities are detailed in the Final Evaluation Report.

Evaluation

The project evaluators were Dr. Elizabeth Langan and Dr. Geoffrey Akst. They reviewed and made recommendations for revisions of the program design, recruitment flier, selection procedures, curriculum, instructional practices, and assessment. They reviewed and suggested revisions for the initial literacy screening instrument, teacher rating forms, and reading, writing and math tests developed in the project. The made major contributions to curriculum development, reviewing units and suggesting revisions. The evaluators observed classes, and interviewed teachers and students to estimate the quality of the curriculum and instruction. Their reactions and recommendations are contained in the Final Evaluation Report.

Summative evaluation consisted of pre- and post-program comparisons of scores on two types of literacy measure: reading, writing and math tests, and teacher ratings. Other parts of the summative evaluation include retention rate, rate of college entry, and estimated college remedial placement levels. Literacy gains and other outcomes are reported in the Final Evaluation Report.

Participant Characteristics

Ethnicity: All except one student were African-American or Latino

Gender: 95% female

Age:

22-30: 24%
31-40: 34%
41-50: 42%

First Language:

English: 69%
Spanish: 17%
French: 9%
Other: 4%

(All participants spoke English fluently.)

Secondary Credential:

High school equivalency: 54%
Regular high school diploma: 30%
Both equivalency and diploma: 17%

Other participant characeristics are detailed in the Final Evaluation Report.

Participation and Retention

Responded to recruitment material: n=176
Accepted based on screening test: n=153
Began program: n=125
Leavers: left program after 1 or 2 classes, maximum 12 hours instruction: n=26
Total Attenders (excluding Leavers): n=99
Short Stayers: stayed approx. 7 weeks (42 hours): n=27
Medium Stayers: stayed approx. 14 weeks (84 hours): n=13
Long Stayers: stayed approx. 21 weeks (126 hours): n=12
Completers: stayed approx. 28 weeks (168 hours): n=47
Completion rate (Completers as a percent of Attenders): 47%
Combined Long Stay + Completion Rate: 60%

Reasons given by participants for non-completion may be found in the Final Evaluation Report.

Literacy Outcomes of Completers

Outcomes are detailed in the Final Evaluation Report. There was significant gain in all areas (reading, writing and math) but the pattern was different depending on the measure used. Based on simulated college tests, there was significant gain from pre to post in writing and math but not reading. The teacher ratings showed significant gain in reading and writing but not in math.

Other Outcomes

College Entry. At three-month follow-up, 62 (65%) of a sample of 96 participants surveyed had been accepted to a college. Of this group, 76% entered a program and 24% entered non-health programs, mostly Liberal Arts. (Further discussion to be found in Final Evaluation Report)

Estimated Remedial Placement. When entering the worker literacy program, most participants would have been assigned to the lowest level of community college remedial writing course. Using test scores on project-developed measures, estimates were made of participants' continuing remedial needs at the end of the program, based on current practices in CUNY community colleges. There was a large upward shift in level of functioning from pre to post in the writing area, some upward movement in math, and no change in reading levels.

Institutionalization

The program has been institutionalized by the labor organization, using project curriculum materials.